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IMPROVEMENT OF THE TECHNICAL AND ECONOMIC INDICATORS OF THE SMALL WATER CONSUMPTION PUMP STATION "TARAKKIYOT" IN BAKHMAL DISTRICT, JIZZAK REGION.

Annotation: *This article presents suggestions and recommendations for improving the technical and economic indicators of the low-cost "Taraqqiyot" pumping station in Bakhmal district, Jizzakh region. We considered the topic "Technical calculation of the development of the pumping station" to be relevant, as one of the urgent problems is to improve the technical condition of the pumping station facilities in order to effectively and rationally use the water coming to Jizzakh region in the agricultural sector.*

Key words: *Pump, pumping station, feasibility studies.*

The preliminary data for the calculations were obtained from the project organization "Jizzakhmelioloyiha". In the received data, the types of crops in the irrigated area, irrigation regimes of crops and irrigation procedures are not given. Therefore, we conduct all calculations based on the schedule of "Water consumption" recommended by the "Pumping stations and energy administration" of Jizzakh region. Table 1 shows the water consumption levels of the pumping station during the irrigation periods, and Figure 1 shows the water consumption graph of the crops in the water-bearing area.

The following amounts were accepted in the accounts:

• irrigated area - 1295 ha;

• coefficient of useful operation of irrigation networks - 0.8;

• forcing coefficient – 1.1.

Based on the quantity of the given hydromodule for each period, consumption water consumption is determined by the following formula:

$$Q_i = \frac{\sum q_i \cdot \Omega \cdot LUF}{1000 \cdot \eta_{m.c.}}$$

here: Ω– total land area, ha;

LUF – land use factor $LUF = 80\%$;

$\eta_{m.c.}$–efficiency of machine canal $\eta_{m.c.}$=78%.

Table 1. Water consumption for each period.

Irrigation period	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII
Consumption water costs Q m^3 /s	0	0	1.1	0.45	0.73	0.4	0.9	0.96	0.6	1.5	0.82	0

Then, based on Table 1, we will build a graph of water consumption for the general irrigation period.

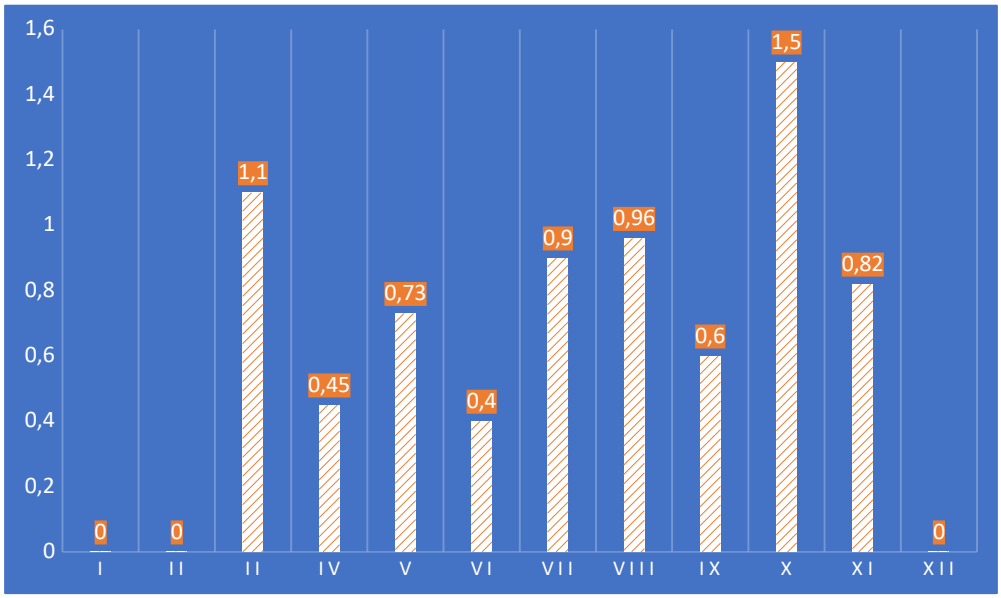

Figure 1. Water consumption graph.

Hydraulic calculation of water-carrying and machine channels of the pumping station.

The hydraulic calculation of the machine channel is carried out against the maximum consumption. The maximum consumption of the pumping station I am designing is Q_{ps}=3.5 m^3/s. The pumping station is checked for accelerated consumption.

Accelerated consumption is defined as follows:

$$Q_{accel}=1,2 \bullet Q_{ps}=1,2*3,5=4,2\ m^3/s$$

Based on the given soil type and Q_{Accel} consumption, the following values are accepted:

- soil type - fine sandy soil;
- roughness coefficient n = 0.0225
- slope of channel walls m = 1.5;
- the width of the upper part of the dam is a= 2÷1.5, and the reserve of height above the water level that accelerates the dam is Δ = 0.4;
- limit speed of soil washing v= 0.7÷1m/s.
- channel bottom slope i= 0.0002;
- the width of the channel bottom is determined as follows:

$$b_{st}=1.2*Q_{max}^{\frac{3}{2}}=1.2*3,5^{\frac{3}{2}}=7,8\,m$$

$$b_{st}=8\ m$$

Quyidagi formulalar orqali kanalning gidravlik elementlari hisoblanadi:

-h– water depth in the water supply channel;

-$\omega=(b+mh)h$- m^2channel live section surface;

-$\chi=b+2h\sqrt{(1+m^2)}$; m –wetted perimeter;

-$R=\omega/\chi$, m-hydraulic radius;

-$C=R^{1/6}/n$ Shezi coefficient;

-$v=C\sqrt{Ri}; \frac{m}{s}$ –¿the speed of the water in the channel;

-$Q=\omega*v; \frac{m^3}{s}$ –¿water consumption.

Information about water levels in the canal.

At the accelerated water level:$h_{Accel}=1{,}58\,m$;

The speed of water flow from the surface of the live section of the channel: v_{Accel}=0.57 m/s;

The maximum speed of water flowing in the channel: v_{max}=0.54 m/s;

The minimum speed of water flowing in the channel: v_{min}=0.24 m/s;

Flowing accelerated water flow in the channel: Q_{Accel}=4,2 m^3/s

Maximum consumption of water flowing in the channel: Q_{max}=3.5 m^3/s

Minimum consumption of water flowing in the channel: Q_{min}=0.2 m^3/s

Nasos turini tanlashda yuqorida aniqlangan ikki ko‘rsatkichdan foydalanimiz:

When choosing the type of pump, we use the two indicators defined above:

Water consumption of one pump unit - Q_n = 0.7 m^3/s.

The total lifting height is H_m = 65.52 m.

Based on these determined indicators, I chose the D 3200-75 pump brand from the summary chart in the pump catalog.

General conclusions and recommendations.

Currently, many pumping stations and devices of water consumers and farms are installed on the second and third lifting machine channels.

2. Such pumping stations and devices are mainly being installed in desert regions.

3. "Taraqqiyot" small consumption pumping station, which raises water from the machine channel of the Taraqqiyot pumping station, is also the second lifting pumping station.

4. "Taraqqiyot" small consumption pumping station supplies water to 1220 ha of land and another 350 l/s to increase the water supply of irrigated land in this area.

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